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## Campus Challenge seeks solutions to real-world problems

*by Rex Swenson, AFRL Munitions Directorate*

*EGLIN AIR FORCE BASE, Fla.* — The Air Force Research Laboratory's Munitions Directorate initiated the Revolutionary Technology (Rev Tech) program to create new airframe/ordnance and guidance/control paradigm shifts in technology.

The directorate has dedicated a portion of its applied research budget to pursue high-risk, high-payoff revolutionary munitions related technologies. The principal goal of the program is to discover and foster technologies that may lead to the development of highly innovative solutions to defeat a variety of targets, including fixed and moving targets, hard and soft targets, and aboveground and deeply buried targets.

According to Rev Tech program manager Charles Cottrell, ideas and concepts representing new approaches are sought to defeat these different types of targets.

"One of the ways that the Rev Tech program seeks to discover and foster the development of innovative solutions is by involving students from universities all across America through a Rev Tech spin-off effort known as Campus Challenge," Mr. Cottrell said.

The third Campus Challenge problem solving competition invitational workshop meeting was held recently at the University of Florida Research Engineering Education Facility (UF - REEF) in Shalimar, Fla. Representatives from 11 different universities met with Air Force representatives to go over the ground rules of the competition and to learn more about the challenge – the requirements for an aerial robotic transformer (ART). With the goal being an efficient, transformable, unmanned platform that is both air and ground mobile.

"The objective of this Campus Challenge effort is similar to our first Campus Challenge, to derive one or more innovative methods to neutralize the operation of an enemy facility located within an unfriendly country," explained Cottrell.

Munitions Directorate Chief Scientist, Dr. Bob Sierakowski co-hosted the meeting with Mr. Cottrell and Dr. John Rogacki, director of the UF- REEF.

Universities chosen to participate in this competition were the University of Arizona, Arizona State University, University of California at Berkley, Cornell University, Embry-Riddle Aeronautical University, Florida A&M University/Florida State University College of Engineering, Georgia Institute of Technology, Ohio University, Saint Louis University, the U.S. Air Force Academy, and a team representing Case Western, University of Florida and Naval Post Graduate School

Upon opening the meeting, Dr. Sierakowski explained to the group that "the purpose of the competition is to solicit innovative, potentially paradigm-shifting ideas that have the potential, upon maturity, to successfully address specific real-world problems of interest to the Air Force research community."

A Commerce Business Daily Broad Area Announcement was used to solicit competitors for this third Campus Challenge, which is broken down into two phases.

"The first phase is a white paper competition and a follow-on proposal competition. The objectives of the competition's first phase is to examine the different forms that ART might take and offer innovative solutions in the form of a submitted white paper," Mr. Cottrell said. "The white papers can propose the use of emerging technologies, the innovative application of off-the-shelf technologies or a combination of both."

Once the papers are submitted in December, representatives from the Munitions Directorate will evaluate and select two of them for further (Phase II) competition.

**continued on page 2**

***continued from page 1***

According to Mr. Cottrell, the two universities that submit a winning white paper will each receive a Phase II \$150,000 grant. At the discretion of those institutions, use of the grants will “flesh out” their respective white papers and create well-structured development and transition proposals.

These Phase II proposals will, as a minimum, consist of a detailed technology roadmap, a detailed development and transition schedule, and a detailed cost estimate. The purpose of these Phase II proposals is to provide the Munitions Directorate with a comprehensive strategy, whereby the least amount of Air Force dollars can be best invested to mature the relevant technologies for advanced development.

“Campus Challenge will give the Air Force access to some of the best minds at the nation’s top engineering schools and open the door for the possible recruitment of outstanding students,” Mr. Cottrell said. “The directorate will also be able to approach a new cadre of nationally known professors for future collaboration. So far the challenge has provided the directorate with truly innovative solutions to vexing problems that are currently being addressed via well-crafted, investment roadmaps.” @

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